Complete Summary

GUIDELINE TITLE

Screening and management of lipids.

BIBLIOGRAPHIC SOURCE(S)

University of Michigan Health System. Screening and management of lipids. Ann Arbor (MI): University of Michigan Health System; 2009 Feb. 15 p. [12 references]

GUIDELINE STATUS

This is the current release of the guideline.

The guideline updates a previous version: University of Michigan Health System. Screening and management of lipids. Ann Arbor (MI): University of Michigan Health System; 2003 Apr. 15 p. [7 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

- Severe dyslipidemias
- Coronary heart disease
- Stroke

GUIDELINE CATEGORY

Management
Prevention

Risk Assessment
Screening
Treatment

CLINICAL SPECIALTY

Cardiology
Family Practice
Geriatrics
Internal Medicine
Nursing
Preventive Medicine

INTENDED USERS

Advanced Practice Nurses
Dietitians
Nurses
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

To present recommendations for primary and secondary prevention of coronary heart disease and stroke by outlining strategies for lipid screening, identifying patients who would benefit from treatment, and recommending appropriate treatment regimens

TARGET POPULATION

Adults 20 to 75 years of age without familial or severe dyslipidemias

INTERVENTIONS AND PRACTICES CONSIDERED

1. Screening with fasting lipid profile
2. Lifestyle modifications, including weight loss, exercise, smoking cessation
3. Framingham-based Global Risk Score
4. Drug therapy:
    - Statin therapy
    - Non-statin lipid agents (fibrates, niacin, resins, ezetimibe)
    - Combination therapy
5. Follow-up

MAJOR OUTCOMES CONSIDERED

- Total cholesterol, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, and triglycerides levels
- Incidence of coronary heart disease and stroke, and rate of coronary events
- Total mortality associated with coronary heart disease
- Drug interactions and adverse effects

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Searches of Electronic Databases
Searches of Unpublished Data

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The literature search for this update began with results of the literature search performed in 1999 to develop the initial guideline published in 2000. For this update a search of more recent literature was conducted on Medline prospectively using the overall keywords of: *cholesterol* (including *hyperlipidemia, lipoproteins, HDL cholesterol*), *consensus development conferences, practice guidelines, guidelines, outcomes and process assessment (health care); clinical trials, controlled clinical trials, multicenter studies, randomized controlled trials, cohort studies; adults; English language*; and *published from 1/1/2000 to 7/31/2007*. In addition to the overall terms, for primary prevention a major search term was *primary prevention of coronary artery disease* with specific topic searches for: *screening, pharmacotherapy, diet, exercise, alternative or complementary medicines*, and *other treatment*. In addition to the overall terms, for secondary prevention a major search term was *secondary prevention (treatment only) of coronary artery disease, peripheral vascular disease, or cerebral vascular disease/stroke* with specific topic searches for: *pharmacotherapy, diet, exercise, alternative or complementary treatment*, and *other treatment*.

The search was conducted in components each keyed to a specific causal link in a formal problem structure (available upon request). The search was supplemented with very recent clinical trials known to expert members of the panel. Negative trials were specifically sought. The search was a single cycle.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Levels of Evidence Reflect the Best Available Literature in Support of an Intervention or Test

A. Randomized controlled trials
B. Controlled trials, no randomization
C. Observational trials
D. Opinion of expert panel

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Conclusions were based on prospective randomized clinical trials if available, to the exclusion of other data; if randomized controlled trials were not available, observational studies were admitted to consideration. If no such data were available for a given link in the problem formulation, expert opinion was used to estimate effect size.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Strength of Recommendation

I = Generally should be performed

II = May be reasonable to perform

III = Generally should not be performed

COST ANALYSIS

Simvastatin is currently the most cost-effective agent per mg/dl lowering in low-density lipoprotein-cholesterol (LDL-C), and lowers LDL-C up to 46% at the 80 mg dosage. Lovastatin and pravastatin are also generic.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

University of Michigan Health System guidelines are reviewed by leadership in departments to which the content is most relevant. This guideline concerning the screening and management of lipids was reviewed by members of the Department of Family Medicine, the Department of Internal Medicine, (Cardiovascular Medicine, General Medicine, and Geriatric Medicine), and Pharmacy Services.

Guidelines are approved by the Primary Care Executive Committee and the Executive Committee of Clinical Affairs.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Note from the National Guideline Clearinghouse (NGC): The following key points summarize the content of the guideline. Refer to the full text for additional information, including detailed information on dosing and cost of drugs and other interventions considered.

The strength of recommendation (I-III) and levels of evidence [A-D] are defined at the end of the "Major Recommendations" field.

Primary Prevention

Screening

Screen men age 35 and older and age 20 to 35 if at increased risk for coronary heart disease (CHD). Screen women only if at increased risk for CHD. *[IC*]* Repeat screening in 5 years in patients with normal lipids *[IID*]*. Screen with fasting lipid profile is advised. If screened non-fasting for patient convenience, follow-up on abnormal non-fasting lipids with a fasting lipid profile.

Risk

See Table 3 of the original guideline document for risk factors. Determination of risk can be facilitated by using the Framingham based Global Risk Score, which predicts 10 year risk of a coronary even *[C]*.

Treatment

- Initial treatment: lifestyle modification—smoking cessation, diet, exercise, and weight reduction *[IA]*. Evaluated low-density lipoprotein cholesterol (LDL-C) response in 6 weeks to 6 months based on patient's cardiovascular risk. *[ID]*
- Drug therapy. Consider if LDL-C remains above threshold: patients with low risk ≥190 mg/dl, moderate risk ≥160 mg/dl, moderately high risk ≥130 (option ≤100) mg/dl *[IIA]*.
- Evidence is insufficient to recommend drug therapy for low high density lipoprotein cholesterol (HDL-C) or high triglycerides for primary prevention.

Secondary Prevention

Screening

Screen with a full lipid panel all patients with CHD, other atherosclerotic cardiovascular disease (ASCVD), diabetes mellitus (DM), or Framingham 10 year risk >20% *[IA]*.

Risk

Determine whether patient risk for cardiovascular events is:

- High: CHD without major risk factors or other risks associated with "very high" risk
- Very high: CHD or other atherosclerotic vascular disease plus one or more of: major risk factors (e.g., diabetes, metabolic syndrome, active cigarette smoking), or acute coronary syndrome

Treatment

- All patients: Lifestyle modification *[IA]*
- Drug therapy: statin therapy should be considered for all patients. Statins reduce mortality and CHD/ASCVD endpoints, including if LDL-C is < 100 mg/dl *[A]*. High potency statins (atorvastatin, rosuvastatin) at high doses reduce events more than low potency statins or high potency statins at low doses. *[A]*
    - Prescribe moderate potency statin (e.g., simvastatin 40 mg/daily) even if low LDL-C *[IA]*

      Note: In DM patients age <40 with no other CHD risk, statin is only marginally cost-effective.

    - LDL-C goals: high risk ≤100 mg/dl, very high risk substantially < 100 (option ≤70) mg/dl *[IIA]*
    - Non-statin lipid agents (fibrates, niacin, resins, ezetimibe) have less or no evidence for improved outcomes compared to statins. *[A]*
    - Combination therapy (statin + any other lipid agent) improves lipids, but may increase myopathy risk, and has yet been shown to improve outcomes compared to statins. *[IIC]*

Cost Effectiveness

- Simvastatin is currently the most cost-effective agent per mg/dl lowering in LDL-C, and lowers LDL-C up to 46% at the 80 mg dosage. Lovastatin and pravastatin are also generic.

Definitions:

Strength of Recommendation

I = Generally should be performed

II = May be reasonable to perform

III = Generally should not be performed

Levels of Evidence

*Levels of evidence reflect the best available literature in support of an intervention or test:

A. Randomized controlled trials
B. Controlled trials, no randomization
C. Observational trials
D. Opinion of expert panel

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Conclusions were based on prospective randomized clinical trials if available, to the exclusion of other data; if randomized controlled trials were not available, observational studies were admitted to consideration. If no such data were available for a given link in the problem formulation, expert opinion was used to estimate effect size.

The type of evidence for each recommendation is given in brackets following the recommendation (see "Major Recommendations").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate screening and management of lipids in order to prevent coronary heart disease and stroke

POTENTIAL HARMS

- *Statins*: The most common adverse effect from statins is muscle aches. No evidence indicates that maligns are more common with one statin than another. Rhabdomyolysis is a life threatening complication of statin therapy, with a 10% mortality rate. The average incidence per 10,000 person-years for monotherapy is 0.44. However, this incidence rises to 5.98 when combined with a fibrate. Other drugs that increase risks are inhibitors of cytochrome P450 enzymes (lovastatin/simvastatin/atorvastatin use CYP3A4, while fluvastatin uses CYP2C9), including cyclosporine, azoles, macrolides, protease inhibitors, verapamil, diltiazem, amiodarone and others. Grapefruit juice also increases the blood level (AUC) of statins that are metabolized by the cytochrome P450 3A4 system e.g., atorvastatin, lovastatin, simvastatin. Myopathy risk is also increased in obstructive liver disease or renal dysfunction, hypothyroidism, serious infections, and advanced age. Careful follow up of liver tests is indicated for those with known liver disease or risk factors for liver disease, or in patients who are on other potentially hepatotoxic medications. If alanine aminotransferase (ALT) is >2 times upper laboratory norm, stop medication or reduce dose.
- *Resins*: Adverse effects are common with resins, and are dose dependent. The most common side effects are bloating, nausea, constipation, and

abdominal pain. Resins interfere with absorption of fat-soluble vitamins and many drugs.
- *Niacin*: Adverse effects of niacin include flushing, pruritus, gastrointestinal (GI) disturbances, fatigue, glucose intolerance, and gout. Hepatic toxicity has been reported, particularly with sustained release products at doses > 2 gm/day. Niacin should be avoided in patients with underlying liver disease or uncontrolled diabetes.
- *Fibrates*: Adverse effects are generally GI, including nausea, dyspepsia, and change in bowel habits. The risk of cholestasis and cholecystectomy is increased. Fibrates carry a small risk of myopathy as monotherapy, but the risk is increased markedly when gemfibrozil is combined with statins. Fibrates may cause a small reversible increase in creatinine, and dose adjustment in renal insufficiency.

Note: General cautions about drug class and drug interactions are provided in Table 6 and Table 7, respectively, in the original full-text guideline document.

- *Exercise*: For patients with known coronary heart disease (CHD), exercise must be tailored to the degree of disease. Aerobic exercises (walking, cycling, swimming) should be done at levels that do not precipitate cardiac ischemia and angina.

CONTRAINDICATIONS

CONTRAINDICATIONS

- Statins are contraindicated in pregnancy.
- Nicotine replacement therapy is contraindicated in unstable angina or acute myocardial infarction.
- Fibrates are contraindicated in severe renal or liver disease, pregnancy, or preexisting gall bladder disease.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

These guidelines should not be construed as including all proper methods of care or excluding other acceptable methods of care reasonably directed to obtaining the same results. The ultimate judgment regarding any specific clinical procedure or treatment must be made by the physician in light of the circumstances presented by the patient.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Patient Resources
Staff Training/Competency Material

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

University of Michigan Health System. Screening and management of lipids. Ann Arbor (MI): University of Michigan Health System; 2009 Feb. 15 p. [12 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2000 May (revised 2009 Feb)

GUIDELINE DEVELOPER(S)

University of Michigan Health System - Academic Institution

SOURCE(S) OF FUNDING

University of Michigan Health System

GUIDELINE COMMITTEE

Lipid Therapy Guideline Team

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Team Leader: William E Barrie, MD, General Medicine

Team Members: R. Van Harrison, PhD, Medical Education; Ujjaini B Khanderia, PharmD, Pharmacy; Robert B Kiningham, MD, Family Medicine; Robert S Rosenson, MD, Cardiology

Guidelines Oversight Team: William E Chavey, MD; R. Van Harrison, PhD; Connie J Standiford, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

The University of Michigan Health System endorses the Guidelines of the Association of American Medical Colleges and the Standards of the Accreditation Council for Continuing Medical Education that the individuals who present educational activities disclose significant relationships with commercial companies whose products or services are discussed. Disclosure of a relationship is not intended to suggest bias in the information presented, but is made to provide readers with information that might be of potential importance to their evaluation of the information.

Team Member	Relationship	Company
William E. Barrie, MD	(none)	
R. Van Harrison, PhD	(none)	
Ujjaini B. Khanderia, PharmD	Speakers Bureau	Pfizer
	Research Support	
Robert B. Kiningham, MD	(none)	
Robert S. Rosenson MD	Consultant	Abbott
	Speaker's Bureau	
	Research Support	
	Consultant	Astra Zenica
	Speaker's Bureau	
	Research Support	
	Research Support	Anthera
	Consultant	Liposcience

Team Member	Relationship	Company
	Shareholder	
	Consultant	Roche
	Consultant	Sanofi Aventis

GUIDELINE STATUS

This is the current release of the guideline.

The guideline updates a previous version: University of Michigan Health System. Screening and management of lipids. Ann Arbor (MI): University of Michigan Health System; 2003 Apr. 15 p. [7 references]

GUIDELINE AVAILABILITY

Electronic copies: Available for download (in Portable Document Format [PDF]) from the University of Michigan Health System Web site.

AVAILABILITY OF COMPANION DOCUMENTS

Continuing Medical Education (CME) information is available from the University of Michigan Health System Web site.

PATIENT RESOURCES

The following is available:

- Cholesterol patient education handout. University of Michigan Health System; 2008 Jun. Various p.

Electronic copies: Available from the University of Michigan Health System Web site.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC STATUS

This summary was completed by ECRI on January 26, 2001. The information was verified by the guideline developer on March 12, 2001. This summary was updated on September 6, 2001 following the withdrawal of the drug Baycol (Cerivastatin). This summary was updated again on January 19, 2004. The information was verified by the guideline developer on February 6, 2004. This summary was updated by ECRI Institute on July 13, 2009. The updated information was verified by the guideline developer on July 21, 2009.

COPYRIGHT STATEMENT

DISCLAIMER

NGC DISCLAIMER

The National Guideline Clearinghouse™ (NGC) does not develop, produce, approve, or endorse the guidelines represented on this site.

All guidelines summarized by NGC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public or private organizations, other government agencies, health care organizations or plans, and similar entities.

Guidelines represented on the NGC Web site are submitted by guideline developers, and are screened solely to determine that they meet the NGC Inclusion Criteria which may be found at http://www.guideline.gov/about/inclusion.aspx .

NGC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or clinical efficacy or effectiveness of the clinical practice guidelines and related materials represented on this site. Moreover, the views and opinions of developers or authors of guidelines represented on this site do not necessarily state or reflect those of NGC, AHRQ, or its contractor ECRI Institute, and inclusion or hosting of guidelines in NGC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding guideline content are directed to contact the guideline developer.

Date Modified: 8/3/2009


DEPARTMENT OF HEALTH & HUMAN SERVICES • USA